

Notice of Allowability

Application No.

09/807,990

Examiner

Nashaat T. Nashed, Ph. D.

Applicant(s)

ISHIKAWA ET AL.

Art Unit

1652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed January 10, 2005.
2. ☒ The allowed claim(s) is/are 15,16 and 20-42.
3. ☒ The drawings filed on 10 January 2005 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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The application has been amended as requested in the communication filed January 10, 2005. Accordingly, claims 1-14, 17, and 19 have been canceled, claims 15, 16, 20-23, and 25-27 have been amended, and new claims 28-42 have been added.

Claims 15, 16, 18 and 20-42 are pending and under consideration.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Vincent K. Shier on April 14, 2005 and April 15, 2005.

The application has been amended as follows:

Claim 15 (Currently Amended): An isolated mutant acid phosphatase with improved nucleoside-5'-phosphate producing ability relative to the wild type enzyme, wherein the enzyme has the amino acid sequence of SEQ ID NO: 125 wherein said amino acid sequence contains substitution of at least one amino acid residue selected from the group consisting of Leu-14, Leu-61, Ala-63, Glu-64, Asn-67, Ser-69, Ala-70, Gly-71, Gly-72, Ile-101, Glu-102, Thr-133, Glu-134, Leu-138, Thr-149, and Ile-151; ~~wherein said substitution comprises replacement of the aforementioned amino acid residue(s) with any amino acid residue other than said aforementioned amino acid residue(s).~~

Claim 16 (Previously Presented): An isolated mutant acid phosphatase having an amino acid sequence of SEQ ID NO: 125 which contains a series of replacements, wherein said replacements are selected from the group consisting of:

- (a) Leu-61 with a glutamine residue, Ala-63 with a glutamine residue, Glu-64 with an alanine residue, Asn-67 with an aspartic acid residue, Ser-69 with an alanine residue, Ala-70 with a valine residue, Gly-72 with an aspartic acid residue, Glu-102 with a leucine residue, Thr-133 with a lysine residue, Glu-134 with an aspartic acid residue, Thr-149 with a serine residue and Ile-151 with a serine residue;
- (b) replacements of Leu-61 with a glutamine residue, Ala-63 with a glutamine residue, Glu-64 with an alanine residue, Asn-67 with an aspartic acid residue, Ser-69 with an alanine residue, Ala-70 with a valine residue, Gly-72 with an aspartic acid residue, Thr-133 with a lysine residue, Glu-134 with an aspartic acid residue, Thr-149 with a alanine residue and Ile-151 with a serine residue;
- (c) replacements of Leu-61 with a glutamine residue, Ala-63 with a glutamine residue, Glu-64 with an alanine residue, Asn-67 with an aspartic acid residue, Ser-69 with an alanine residue, Ala-70 with a

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- glutamic acid residue, Gly-72 with an aspartic acid residue, Thr-133 with a lysine residue, Glu-134 with an aspartic acid residue, Thr-149 with a glycine residue and Ile-151 with a serine residue;
- (d) replacements of Leu-61 with a glutamine residue, Ala-63 with a glutamine residue, Glu-64 with an alanine residue, Asn-67 with an aspartic acid residue, Ser-69 with an alanine residue, Ala-70 with a lysine residue, Gly-72 with an aspartic acid residue, Thr-133 with a lysine residue, Glu-134 with an aspartic acid residue, Thr-149 with a glycine residue and Ile-151 with a serine residue; and
- (e) replacements of Leu-61 with a glutamine residue, Ala-63 with a glutamine residue, Glu-64 with an alanine residue, Asn-67 with an aspartic acid residue, Ser-69 with an alanine residue, Ala-70 with a methionine residue, Gly-72 with an aspartic acid residue, Glu-102 with a glutamine residue, Thr-133 with a lysine residue, Glu-134 with an aspartic acid residue, Thr-149 with a serine residue and Ile-151 with a serine residue.

Claim 17 (Canceled)

Claim 18 (Canceled)

Claim 19 (Canceled)

Claim 20 (Currently Amended): A crystal of an acid phosphatase having an amino acid sequence of SEQ ID NO: 124, which has a space group ~~P6₃22~~ P6₃22 of a hexagonal system.

Claim 21 (Currently Amended): A crystal of a mutant enzyme acid phosphatase having an amino acid sequence of SEQ ID NO: 124, wherein the Gly-74 is replaced with an aspartic acid residue and Ile-153 is replaced with a serine residue, which has a space group ~~P2₁2₁2₁~~ P2₁2₁2₁ of a rhombic system.

Claim 22 (Currently Amended): A crystal of complex of an acid phosphatase having an amino acid sequence of SEQ ID NO: 124 and molybdate, which has a space group ~~P3₁21~~ P3₁21 of a trigonal system.

Claim 23 (Previously Presented): A gene coding for a mutant acid phosphatase according to claim 15.

Claim 24 (Previously Presented): A recombinant DNA, which contains the gene according to claim 23.

Claim 25 (Previously Presented): A microorganism comprising the gene according to claim 23.

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Claim 26 (Currently Amended): A method for producing a nucleoside-5'-phosphate, which comprises:

reacting a nucleoside and a phosphate donor with in the presence of a mutant acid phosphatase according to claim 15 to produce nucleoside-5'-phosphate and collecting the nucleoside-5'-phosphate,

wherein said phosphate donor is a phosphoric acid ester compound, or a salt thereof, selected from the group consisting of polyphosphoric acid, phenyl phosphate, acetyl phosphate, and carbamyl phosphate.

Claim 27 (Previously Presented): The method according to claim 26, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 28 (Currently Amended): A method for producing a nucleoside-5'-phosphate, which comprises:

reacting a nucleoside and a phosphate donor with in the presence of a microorganism according to claim 25 to produce nucleoside-5'-phosphate and collecting the nucleoside-5'-phosphate,

wherein said phosphate donor is a phosphoric acid ester compound, or a salt thereof, selected from the group consisting of polyphosphoric acid, phenyl phosphate, acetyl phosphate, and carbamyl phosphate.

Claim 29 (Previously Presented): The method according to claim 28, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 30 (Previously Presented): A microorganism comprising the recombinant DNA according to claim 24.

Claim 31 (Currently Amended): A method for producing a nucleoside-5' phosphate, which comprises:

reacting a nucleoside and a phosphate donor with in the presence of a microorganism according to claim 30 to produce nucleoside-5'-phosphate and collecting the nucleoside-5'-phosphate,

wherein said phosphate donor is a phosphoric acid ester compound, or a salt thereof, selected from the group consisting of polyphosphoric acid, phenyl phosphate, acetyl phosphate, and carbamyl phosphate.

Claim 32 (Previously Presented): The method according to claim 31, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 33 (Currently Amended): A method for producing a nucleoside-5'-phosphate, which comprises:

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reacting a nucleoside and a phosphate donor ~~with~~ in the presence of a mutant acid phosphatase according to claim 16 to produce nucleoside-5'-phosphate and collecting the nucleoside-5'-phosphate,

wherein said phosphate donor is a phosphoric acid ester compound, or a salt thereof, selected from the group consisting of polyphosphoric acid, phenyl phosphate, acetyl phosphate, and carbamyl phosphate.

Claim 34 (Previously Presented): The method according to claim 33, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 35 (Previously Presented): A gene coding for a mutant acid phosphatase according to claim 16.

Claim 36 (Previously Presented): A microorganism comprising the gene according to claim 35 29.

Claim 37 (Currently Amended): A method for producing a nucleoside-5'-phosphate, which comprises:

reacting a nucleoside and a phosphate donor ~~with~~ in the presence of a microorganism according to claim 36 25 to produce nucleoside-5'-phosphate and collecting the nucleoside-5'-phosphate,

wherein said phosphate donor is a phosphoric acid ester compound, or a salt thereof, selected from the group consisting of polyphosphoric acid, phenyl phosphate, acetyl phosphate, and carbamyl phosphate.

Claim 38 (Previously Presented): The method according to claim 37, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 39 (Previously Presented): A recombinant DNA, which contains the gene according to claim 35.

Claim 40 (Previously Presented): A microorganism comprising the recombinant DNA according to claim 39.

Claim 41 (Currently Amended): A method for producing a nucleoside-5'-phosphate, which comprises:

reacting a nucleoside and a phosphate donor ~~with~~ in the presence of a microorganism according to claim 40 25 to produce nucleoside-5'-phosphate and collecting the nucleoside-5'-phosphate,

wherein said phosphate donor is a phosphoric acid ester compound, or a salt thereof, selected from the group consisting of polyphosphoric acid, phenyl phosphate, acetyl phosphate, and carbamyl phosphate.

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Claim 42 (Previously Presented): The method according to claim 41, wherein said reacting is at a pH ranging from 3.0-5.5.

Claims 15, 16, and 20-42 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nashaat T. Nashed, Ph. D. whose telephone number is 571-272-0934. The examiner can normally be reached on MTTF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy can be reached on 571-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Primary Examiner
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